

Oroville Facilities Relicensing Project

(FERC PROJECT NO. 2100)

SP-R7 Reservoir Boating Survey

January ~~10~~16, 2002

1.0 Introduction/Background

Boating is a major recreation activity in the Study Area, and is directly affected by project operations, particularly reservoir pool levels. This study will address Issue Statement R1—~~a~~adequacy of existing recreation facilities, opportunities, and access to accommodate current use and future demand, and the following specific recreation issues: RE~~—~~1, 2, 5-17, 19-39, 55, 56, 60, 64-83, 95, 96, 104, and 105, and 110, 118-130, 132-145, 147, 150, and 151.

~~--~~The most recent relevant study that will be used for this effort~~utilized as an information source~~ is the 1996 study conducted by Guthrie et al. (1997). A list of other relevant studies is ~~found~~included in Attachment A.

2.0 Study Objective

The main objective of this study is to describe existing boating use and water surface management on Lake Oroville and other water bodies ~~that allow boating~~where boating is permitted within the Study Area. The study will address Issue Statement R1—adequacy of recreation facilities. ~~Study results will be used to determine existing use levels for boating, and to help determine if any water surface management changes are appropriate~~needed.

3.0 Relationship to Relicensing/Need for the Study

This study is needed to meet the Federal Energy Regulatory Commission's (FERC's) direction regarding preparation of comprehensive recreation plans, and more specifically to include information in the license application ~~regarding~~on existing recreation uses at Project~~project~~ facilities and waters (Chapter 1, Subpart F, Section 4.51 of; 18 CFR).

Additionally, the study is needed to accurately assess the impact of project operations, ~~and~~ recreation area management, and fish and wildlife management on reservoir boating. ~~The 1996~~ Guthrie et al. (1997) ~~study referenced above,~~ only superficially examined reservoir boating. A brief survey was administered to boaters as they entered controlled areas. Rischbieter (~~1997~~2001) reported use in terms of boat launches for ~~1995-1999~~ and ~~1996~~2000, however, boater surveys were not part of ~~this~~that study.

4.0 Study Area

The ~~study~~Study area includes Lake Oroville, the lands and waters~~area~~ within ~~the~~and adjacent to (1/4 mile) ~~the Oroville Facilities~~ FERC project boundary, boundary and adjacent lands, facilities, and areas with a clear project nexus.

The following sites are included:

Campgrounds

Bidwell Canyon Campground	Floating Campsites
Bloomer Cove Boat-In Campsite (BIC)	Lime Saddle Campground
Bloomer Knoll BIC	Lime Saddle Group Campground
Bloomer Point BIC	Loafer Creek Campground
Bloomer Group BIC	Loafer Creek Group Campground
Craig Saddle BIC	Loafer Creek Horse Campground
Foreman Creek BIC	Oroville Wildlife Area (OWA) (Larkin Road Camping Area)
Goat Ranch BIC	<u>North</u> Thermalito North -Forebay RV “en route” Campground

Day Use Areas (DUAs)

Lake Oroville Visitor Center	Saddle Dam DUA
Lime Saddle DUA	<u>North</u> Thermalito North -Forebay DUA
Bidwell Canyon DUA	<u>South</u> Thermalito South -Forebay DUA
Loafer Creek DUA	Thermalito Afterbay DUA (off Highway 162)
Oroville Dam Overlook Area	Thermalito Afterbay Wilbur Road DUA
Spillway DUA	Thermalito Afterbay Larkin Road DUA
	<u>Burma Road and Lakeland Boulevard DUA</u>

Boat Launches

Lime Saddle Boat Launch Area (BLA)	Foreman Creek Car-Top BLR
Loafer Creek BLA	Dark Canyon Car-Top BLR
Bidwell Canyon BLA	Stringtown Car-Top BLR
Enterprise Boat Launch Ramp (BLR)	Vinton Gulch Car-Top BLR
Nelson Bar Car-Top BLR	<u>Thermalito Afterbay (4)</u>
<u>South Thermalito South-Forebay</u>	<u>North Thermalito North-Forebay</u>
<u>Diversion Pool-Burma Road and RR</u>	
<u>Grade</u>	

Other Recreational Facilities with Project Nexus

<u>Lime Saddle Marina</u>	<u>Bidwell Marina</u>
Floating Restrooms	Aquatic Center
Brad P. Freeman Bicycle Trail	<u>Feather River Fish Hatchery</u>
<u>Lake Oroville State Recreation Area</u>	Clay Pit State Vehicular Recreation Area (SVRA)
<u>(LOSRA) Hiking/Equestrian Trail</u>	Model Aircraft Flying Area
Diversi <u>o</u> n Pool	<u>OWA</u>
<u>Dispersed use areas along the upper-upstream and lower-downstream reaches of the Feather River</u>	

5.0 General Approach

~~This study consists of the following six tasks:~~

Task 1—Research Local Boating Issues

This task will ~~conduct~~ research ~~on~~ boating issues in the ~~study~~ Study area ~~Area~~, including boating accident statistics, boating law enforcement problems, and boating regulations and management. Boating regulations will be summarized by reservoir. Current and historical accident information and boating regulations will be obtained from the Butte County Sheriff's ~~Department marine patrol~~ Office, California Department of Parks and Recreation (~~CDPR~~), and California Department of Boating and Waterways (~~DBW~~ Cal Boating). Accident history information will, at a minimum, identify yearly total boating accidents, boating deaths, and boating-related property damage. ~~—If Cal Boating DBW releases additional boating accident information, such as causes and descriptors for of boating accidents, then this information will also be summarized. Water hazards will also be identified at various pool levels. The number of times that a particular launch ramp or boating area experienced bad conditions will also will be noted—.~~ Other issues of concern to the general public and boating-related business owners will be solicited in questionnaires ~~which that that~~ will be developed for SP-R13 ~~—~~, Recreation Surveys (problems with stumps, shallow areas, etc.).

Task 2—Assess Boating Use Levels

Prior to estimating use, each body of water for which data ~~collection~~ will ~~be collected~~ may be divided into segments. ~~segments~~ Due to its size, Lake Oroville will be divided into four segments. One segment will include the West Branch and North Fork, and the second will include the ~~area of the~~ junction ~~are of~~ the West Branch and North Fork to Foreman Creek. The third segment will ~~be encompass~~ the main portion of the reservoir, south of Foreman Creek to the dam, and the fourth segment will include the Middle and South Forks. ~~Since a portion of the Middle Fork is designated as Wild and Scenic, field crews may have to use nonmotorized craft to access this area, or limit data collection to what can be observed from motorized craft outside the Wild and Scenic portion of this fourth segment.~~ Depending on field conditions, a similar approach may be applied to other water bodies where data collection will occur.

For each body of water being sampled, two field staff will be involved, one to operate the boat, the other to record use. Boating use levels will be assessed on Lake Oroville, Diversion Pool, Spillway, Thermalito North Forebay, Thermalito South Forebay, and Thermalito Afterbay. Boating types that will be assessed include watercraft numbers, watercraft types (power boats, ~~personal watercraft (PWC)~~, sailboats, ~~houseboats~~, non-motorized boats, ~~boats over 26', boats under 26'~~, etc.), and boating-related activities (water skiing, fishing, etc.). Existing use will also be noted for BICs at Bloomer Primitive, Vinton Gulch, Goat Ranch, Foreman Creek, and Craig Saddle ~~and floating campsites~~. Existing use information will, for each reservoir, summarize boats at-one-time (~~BAOT~~) on the water surface, and vehicles and boat trailers at-one-time. Parking lot capacities at boat launches during morning, afternoon, and evening periods during weekday, weekend, and holiday periods will also be discussed. Data for these estimates will be ~~collected as input to~~ used in SP-R9, ~~the~~ Existing Recreation Use Study. Use estimates will be collected throughout the year. Use estimates will generally coincide with ~~the Existing use~~ SP-R9 use sampling times (Table 1). While on Lake Oroville Reservoir, Forebays, or Afterbay in a boat during survey days, researchers will also survey use at ~~dispersed~~ shoreline ~~dispersed~~ sites. ~~Use patterns of marina-based boats will be surveyed as to their percentage in use on different days, frequency, etc.~~ Along with use estimates, information on boating conditions will be collected. ~~A rating system (i.e., poor, fair, good, etc.) will be developed to facilitate rapid, objective assessment of boating conditions.~~ A sample data collection form is ~~found~~ included in Attachment B, ~~and a detailed implementation schedule is found in Attachment C.~~

To validate boating use levels obtained ~~via~~ ~~enduring~~ reservoir counts, aerial photography will be used to count all boats on the reservoir ~~and in marinas~~ during several ~~randomly~~ selected days.

~~spell out acronyms~~ States Organization for Boating Access (SOPA) and National Recreation and Park Association (NRPA),
~~and concessionaires~~

Table 1

Tentative Sampling Schedule for Monitoring Boating Use

Season	Boating Areas	
	Reservoir Day Use	Boat-In Campsites Overnight Use
Spring, 2002		
May	6	4
-Memorial Day Weekend	3	4
BLD Subtotals	9	
Summer, 2002		
June	2	2
July	4	2
-Independence Day	1	2
August	4	6
BLD Subtotals	11	
Fall, 2002		
September	2	2
-Labor Day Weekend	3	2
October	2	2
November	2	6
BLD Subtotals	9	
Winter, 2002-2003		
December	1	1
January	1	1
February	1	1
-Presidents' Day Weekend	3	1
March	1	1
BLD Subtotals	7	4
Spring, 2003		
April	4	4
-Spring Break/Easter	3	4
Weekend	7	8
BLD Subtotals		
Totals	43 days	24 days

Task 3—Assess Boating Infrastructure

~~This task will present data on the overall infrastructure that supports boating (marinas, boat launches, gas supply, docks, pump outs, etc.). Facility condition will also be summarized. Data for this assessment will be collected in Study #10, the Recreation Condition Facility Inventory. Infrastructure deficiencies will be noted and summarized. The existing level of boating infrastructure and services will be compared with boating facility standards ~~spell out acronyms~~ (SOBA, NRPA, etc.) to determine if there are any deficiencies based on standards.~~

~~How reservoir pool levels may affect access to recreation facilities and the reservoirs will be assessed as required by the FERC. This potential effect on boating infrastructure will be assessed and documented. For boat launch sites an assessment of the ramp's effectiveness at high and low pool will be conducted. An effective bottom elevation for the toe of each ramp lane will be identified. A standard of a minimum three feet of water at the toe of the ramp is commonly used to assess effectiveness and accessibility at boat launches. Typical periods of time when this standard is not met will be described for each body of water. Further comparison will be made with visitation trends (peak and holiday use) and the availability of other public ramps to meet seasonal and year-round boater access needs (at least one ramp available year-round per reservoir if feasible). Other potential issues related to floating docks, gangways, fuel docks, piers, marinas, and other facilities will be discussed with DWR and DPR facility operators. Other related pool level effects on shoreline facilities will be collected in Study #13, Recreation Surveys.~~

Task 3—Assess Boating Infrastructure

This task will present data on the overall infrastructure that supports boating (marinas, boat launches, gas supply, docks, ~~land-based restrooms, floating restrooms, pump-outs, etc.~~). Facility conditions will also be summarized. Data for this assessment will be collected in SP-R10—Recreation Facility and Condition Inventory. Infrastructure deficiencies will be noted and summarized. The existing level of boating infrastructure and services will be compared with boating facility standards ~~where available~~ (States Organization for Boating Access (SOBA), ~~State DBW standards~~, and National Recreation and Park Association (NRPA) etc.) to determine if there are any deficiencies based on standards.

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Task 4—Assess Boaters' Perceptions

This task will assess boaters' attitudes and opinions ~~about~~ on the ~~p~~Project's reservoirs and ~~of~~ other boaters. Boaters' attitudes and opinions will be summarized regarding potential water surface crowding; user conflicts; reservoir conditions; boating regulations; launching and docking facilities; pool levels; and potential management and facility improvements. —Boater group characteristics will also be summarized, including group size, primary boating activities, and lengths of stays. Data for these summaries will be collected as part of SP-R13—Recreation Surveys.

Task 5—Surface Water Boating Capacity

Surface water boating carrying capacity will be estimated for Lake Oroville, ~~The~~ Diversion Pool, Thermalito Forebays, and ~~the~~ Afterbay. ~~A range of capacities~~ Capacity will be assessed based on several factors such as water depth, survey results, watercraft type and boating standards. Since reservoir pool levels can vary dramatically throughout the year, special emphasis will be placed on examining physical capacity as a function of varying pool levels. This capacity analysis will be conducted in conjunction with SP-R8 ~~the~~ Carrying Capacity Study. This task will focus on surface water area for boating use. In this analysis, four types of capacity types will be considered: ecological, facility, physical/spatial, and social.

For each body of water (~~Reservoir, Forebays, and Afterbay~~), conclusions will be made regarding which of the four capacity types is a limiting factor(s). Qualitative and quantitative data will be used to make these conclusions. A limiting factor is defined as an indicator that limits or puts a cap on the level of recreational use (capacity) at a site or area. For example, the number of boat launches available (facility capacity) potentially limits boating if all the ramps are busy. If boating activity has no space to expand or is constrained by shallows, physical capacity is a second indicator to consider. If a boating area is located next to sensitive wildlife or vegetation resources, these resources may be an ecologically limiting factor. Finally, if a body of water or segment is perceived as extremely crowded or there are user conflicts, social capacity may be a limiting factor no matter what the use level may be. ~~SOBA, SOBA, NRPANRPA~~, and other standards will be considered in this assessment.

Once identified, limiting factors will become the focus for assessing recreation capacity at a reservoir or reservoir segment, or monitoring boating capacity in the future. While all four capacity types being considered (physical/spatial, facility, ecological, and social) may potentially be a limiting factor(s), typically only one or two factors will dominate. Qualitative and quantitative data will be used in this selection process.

Based on this process, an overall assessment of reservoir and reservoir segment boating capacity will be defined. This assessment will characterize boating use levels in relation to capacity levels using four general conditions: below, approaching, at, or exceeding capacity levels.

Two key timeframes will be considered: typical weekend afternoons in Spring and early Summer, and holiday weekend afternoons from Memorial Day to Labor Day Weekends.

For reservoir segments, overall capacity will be assessed based on a review of several capacity types. Ecological concerns will be addressed by reviewing the percentage of shoreline vegetation made up of sensitive riparian/wetland vegetation (from Threatened and Endangered Species (TES) GIS mapping) for each segment, as well as other ecological variables.

The physical/spatial capacity of reservoir segments will be assessed using data on the number of boats counted in each segment and dividing this count by the number of surface water acres in each of the segments. This number will then be compared with a theoretical average number of surface water acres needed per boat. Many boating capacity standards for the surface water acreage needed by boaters have been developed and used over the years (SOBA, NRPA, etc.). These capacity standards cover a wide range, from as few as 4 surface water acres needed per boat to 25 acres needed per boat; with a few standards are as high as 40 acres needed per boat for space-dependent activities such as water skiing and PWC use in narrow areas. However, it should be noted that these types of standards are highly dependent on several variables. For this ~~study~~ Study area, physical conditions and reservoir activities will be assessed. A theoretical boating capacity standard for surface water acres needed per boat will be developed in a manner that is reasonable and consistent with ~~these~~ other standards.

These boating capacity standards are likely to be subject to variation based on reservoir-specific factors such as water depth, shoreline configuration, visitor perceptions, number of accidents involving other boats, boat types and speeds, dominant boating activities, and the types of activities that are popular on the water and along the shoreline.

Boaters' responses to crowding questions in SP-R13, ~~Recreation Surveys~~, as well as user conflict responses will address social capacity by reservoir segment ~~by reservoir segment~~.

Facility capacity by reservoir segment will be addressed by reviewing facility utilization levels at boater facilities located in each segment.

Task 6—~~Summary~~ Draft Final Report Preparation

This task involves the preparation of a ~~summary~~ report, ~~which that~~ ~~that~~ ~~will~~ presents the results of Tasks 1 through 5. The boating results will be shown in tabular or graphical form ~~and~~ ~~along with related~~ descriptive text ~~will summarize these results~~. A GIS ~~map~~ figure will be prepared representing general conditions for ~~the Reservoir~~ Lake Oroville, ~~the Diversion Pool~~, the Forebays, and the Afterbay.

6.0 Results and Products/Deliverables

Results

Results will be used to determine if management changes or facility upgrades are needed to improve boater²_S experiences. Results will also be used to identify potential impacts to natural and cultural resources on the shoreline.

Products/Deliverables

The following products will be developed for this study:

- GIS ~~map-figure~~ showing surface water boating capacity levels for affected bodies of water at varying pool levels
- GIS map depicting locations of boat hazards for affected bodies of water at varying pool levels
- Interim ~~Summary~~ Report
- Draft Final ~~Summary~~ Report

7.0 ~~Study Plan~~ Coordination and Implementation Strategy

Coordination with Other Resource Areas/Studies

This study will require coordination with SP-R2, ~~Recreation Safety Assessment~~; SP-R3, ~~Assess Relationship of Project Operations and Recreation~~; SP-R4, ~~Assess Relationship of Fish/Wildlife Management and Recreation~~; SP-R5, ~~Assess Recreation Areas Management~~; SP-R6, ~~ADA Accessibility Assessment~~; SP-R8, ~~Carrying Capacity~~; SP-R9, ~~Existing Recreation Use~~; SP-R10, ~~Recreation Facility and Condition Inventory Study~~; and SP-R12, ~~Projected Recreation Use~~. It will also require coordination with studies being conducted by the Cultural Resources and Environmental Work Groups.

Schedule

~~Data Collection: May, 2002 through April, 2003~~

~~Data analysis and Report Writing and Data data Analysisanalysis: October, May 2002 through July, 2003~~
~~An Interim interim report on Spring and Summer boating will be prepared in Interim Report due: October November~~

~~Draft A final report due: with all seasons of use will be prepared in July, August 2003~~

Issues, ~~concerns~~ Concerns, ~~comments~~ Comments ~~tracking~~ Tracking, and/or ~~Regulatory~~ Regulatory Compliance Requirements

The results of the study will address Issue Statement R1 ~~—Aa~~ adequacy of existing recreation facilities, opportunities, and access to accommodate current use and future demand, and the following specific recreation issues: RE 1, ~~2~~, 5-17, 19-39, 55, 56, 60, 64-83, 95, 96, 104, ~~105~~, 118-130, 132-145, 147, 150, and 151.

8.0 Study Schedule

Data collection: May 2002 through April 2003.

Data analysis and report writing: May through July 2003.

Interim Report due: November 2002.

Draft Final Report due: August 2003.

89.0 References

- Guthrie, R., D. A. Penland, and E. Seagle. ~~1997~~. Lake Oroville State Recreation Area Recreational Use Study. ~~Unpublished Contract report prepared for DWR~~, Chico State University, Chico, CA.
- Rischbieter, D. C. ~~2001+1997~~. Lake Oroville State Recreation Area Summary of Attendance Data, January 1995-December, ~~2000+1996~~. Technical Information Record ND-~~0197~~-1

Attachment A—~~Existing Information~~

Other Relevant Boating Studies

1. Upper North Fork Feather River, Lake Almanor Reservoir ~~boating~~ Boating study Study
2. A Study of Boater Recreation on Lake Berryessa, ~~California~~ CA.
3. DWR Recreation Plan for Lake Oroville State Recreation Area
4. Poe Hydroelectric Project Recreation Studies
5. LOSRA ~~attendance~~ Attendance data Data summaries Summaries, (1995-2000)
6. Aquatic Center ~~attendance~~ Attendance logs Logs
7. LOSRA Recreation Plan
8. Butte Sailing Club turnouts
9. Sailing and Boating Safety Instruction Programs

Attachment B

Sample Reservoir Boating Use Data Collection Form

User Count Observations—Boating and Shoreline Use

Lake Oroville Reservoir

Section A

Section 7: Other Activities Observed																				
Date	Weather	Time	Watercraft on Water				Anglers		Vehicles		Other Activities Observed								Camping Tents	
			Power	Sail	PWC	Paddle	Boat	Bank	Vehicles	w/ trailers	Picnic	Swim	Relax	Bike/Hike	Hunt	Rest	Equest.	Windsurf		Waterski
4-Jul	Rainy	830	3	0	2	0	0	4	8	1	0	0	0	0	0	0	0	0	0	0
12-Jul	Cloudy	1331	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Jul	Sunny, hot	905	7	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	2
1-Aug	AM Clouds\Sun after 1530	1435	0	2	0	0	4	2	0	0	6	0	4	0	0	0	0	0	0	0
22-Aug	AM Clouds\Sun afternoon	925	1	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	3

Section B

Section 2																				
Date	Weather	Time	Watercraft on Water				Anglers		Vehicles		Other Activities Observed									Camping
			Power	Sail	PWC	Paddle	Boat	Bank	Vehicles	w/ trailers	Picnic	Swim	Relax	Bike/Hike	Hunt	Rest	Equest.	Windsurf	Waterski	Tents
4-Jul	Rainy	850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
12-Jul	Cloudy	1340	9	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	5	0
26-Jul	Sunny, hot	925	6	0	0	0	0	0	0	0	0	2	5	0	0	0	0	0	2	0
1-Aug	AM Clouds\Sun after 1530	1450	8	0	1	0	3	0	0	0	0	0	4	0	0	0	0	0	2	0
22-Aug	AM Clouds\Sun afternoon	1020	4	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0

Section C

Section C																				
Date	Weather	Time	Watercraft on Water				Anglers		Vehicles		Other Activities Observed									Camping
			Power	Sail	PWC	Paddle	Boat	Bank	Vehicles	w/ trailers	Picnic	Swim	Relax	Bike/Hike	Hunt	Rest	Equest.	Windsurf	Waterski	Tents
4-Jul	Rainy	910	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12-Jul	Cloudy	1344	5	0	2	0	2	0	0	0	6	0	0	0	0	0	0	0	3	
26-Jul	Sunny, hot	900	2	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	2	
1-Aug	AM Clouds\Sun after 1530	1425	7	0	1	1	0	4	0	0	0	0	8	0	0	0	0	4	7	
22-Aug	AM Clouds\Sun afternoon	1030	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	

Section D

Camping																				
Date	Weather	Time	Watercraft on Water				Anglers		Vehicles		Other Activities Observed								Camping Tents	
			Power	Sail	PWC	Paddle	Boat	Bank	Vehicles	w/ trailers	Picnic	Swim	Relax	Bike/Hike	Hunt	Rest	Equest.	Windsurf		Waterski
4-Jul	Rainy	925	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Jul	Cloudy	1346	8	0	0	0	0	0	0	0	11	11	0	0	0	0	0	0	2	0
26-Jul	Sunny, hot	845	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
1-Aug	AM Clouds\Sun after 1530	1420	16	0	2	1	6	0	0	0	0	0	8	0	0	0	0	0	6	0
22-Aug	AM Clouds\Sun afternoon	1033	6	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0

Attachment C

A. Implementation Schedule for Field Mobilization

The following section describes factors to be addressed prior to the 2002-03 field season for researchers and field staff who will collect information at Project sites. Several categories need attention in the next few months such as survey instrumentation, field staff organization, and research materials. Table 1 displays the milestone dates to be met prior to the 2002-03 field season. Meeting these dates is crucial to beginning the field season on time in order to meet future established schedule dates.

Four action items are associated with the survey instrumentation: 1) Completing draft data collection and on-site surveys, 2) pre-testing survey and other data collection instruments, 3) adjusting survey instruments as needed, and 4) printing an appropriate number of survey instruments for the field season. The on-site surveys for visitors (campers and day use area users), boaters, anglers, and river recreationists will be completed and pre-tested by March 2002.

Two action items are associated with field staff: 1) Hire appropriate field staff, and 2) train them for fieldwork. Field staff will need to be formally hired and available for training by April 1st. This will allow field staff coordinators enough time prior to the sample season to finalize employment details and get enough staff onboard. A month is needed for training all field staff, as they will need to become knowledgeable about content and administration of at least five surveys and other data collection forms, and the various sites in the Project Area.

Researchers will need an array of materials from clipboards, cellular telephones and laptop computers to watercraft, rental cars, and a field station. Four action items are associated with research materials: 1) Secure two, long-term rental cars to be kept at the field station and used on site, 2) secure watercraft to be available on-call throughout the field season, 3) obtain a variety of clerical materials such as cellular telephones (4), laptop computers for researchers (2), uniforms, nametags, clipboards, field boxes, paper, pens, etc., and 4) secure a field station close the Project where researchers can live and work (cook meals, sleep, use computer work stations, conduct staff meetings, etc.).

The field season begins May 1st to meet scientific sample criteria and scheduling framework.

Table I. Implementation Schedule for Pre-Sample Season

Action Item	2002											
	J	F	M	A	M	J	J	A	S	O	N	D
<u>Survey Instrumentation</u>												
1. <u>Complete Draft Data Collection Instruments</u>			X									
2. <u>Pre-test Draft Data Collection Instruments</u>			X									
3. <u>Adjust Draft Data Collection Instruments</u>			X									
4. <u>Print Final Data Collection Instruments</u>			X									
<u>Field staff</u>												
5. <u>Hire Field staff</u>			X									
6. <u>Train Field staff</u>				X								
<u>Research Materials</u>												
7. <u>Secure Researcher Rental Vehicles</u>			X									
8. <u>Secure Researcher Watercraft</u>			X									
9. <u>Obtain Research Clerical Materials</u>				X								
10. <u>Secure Researcher Field Station</u>			X									
<u>Start Field Season</u>												
11. <u>Begin Field Season</u>					X							